**GRAPHIC SCREENSHOT and TEXT for Editing**
*(**Please note on sources.** Most are in Spanish and the titles of reports and documents originated in Spanish. I am not sure of if we leave them in Spanish for the English language versions of the map and graphics. Or if they need to be translated into English by GPJ)*

## States with Denomination of Origin for Mezcal

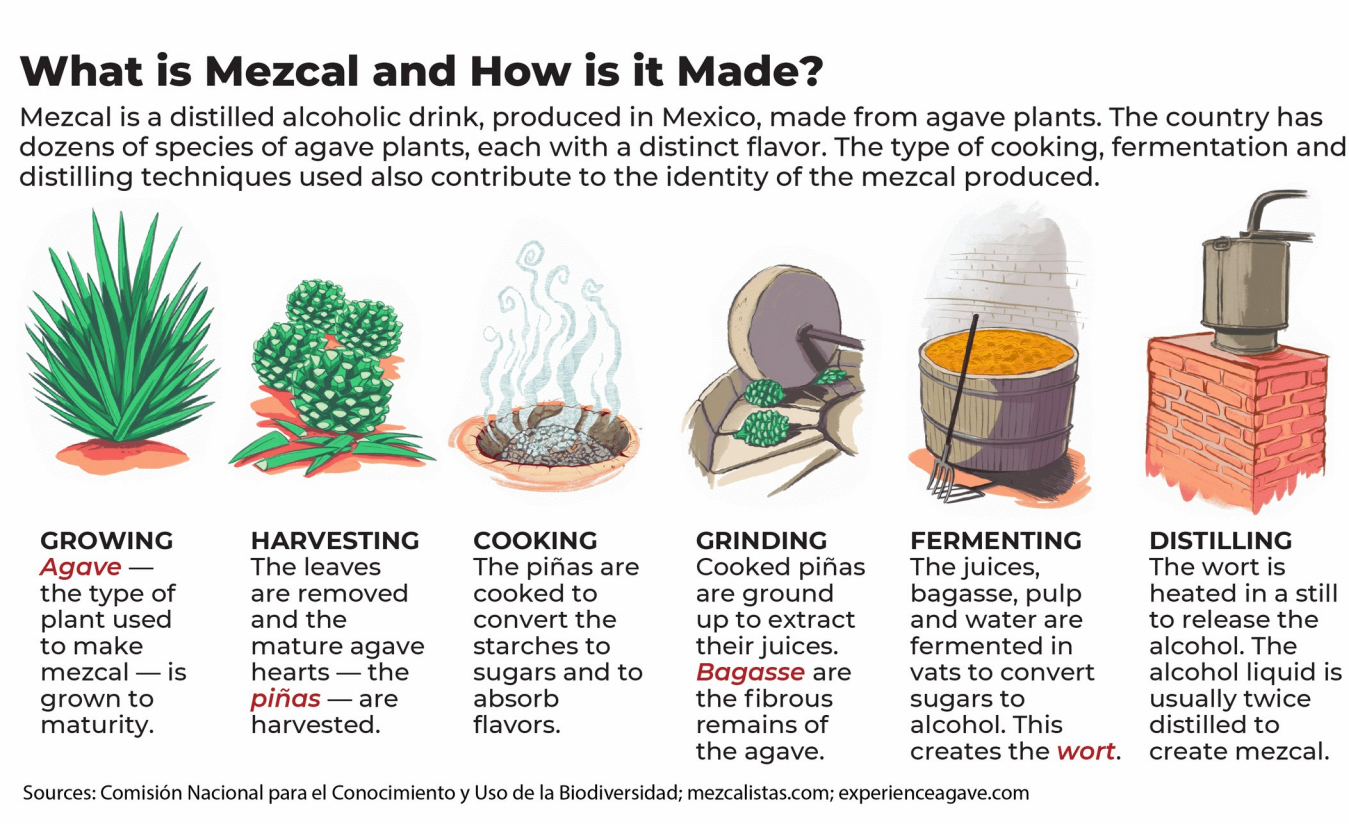
While mezcal is unofficially produced all over Mexico, only regions with denomination of origin are authorized to label their product as “mezcal.”

MEXICO
U.S.

SINALOA
DURANGO
ZACATECAS
SAN LUIS POTOSÍ
AGUASCALIENTES

TAMAULIPAS
GUANAJUATO
ESTADO DE MÉXICO
MICHOACÁN
MORELOS
GUERRERO
PUEBLA
OAXACA

Source: Diario Oficial de la Federación — October 12, 2021





## What is Mezcal and How is it Made?

Mezcal is a distilled alcoholic drink, produced in Mexico, made from agave plants. The country has dozens of species of agave plants, each with a distinct flavor. The type of cooking, fermentation and distilling techniques used also contribute to the identity of the mezcal produced.


GROWING

Agave — the type of plant used to make mezcal — is grown to maturity.

HARVESTING
The leaves are removed and the mature agave hearts — the piñas — are harvested.

COOKING
The piñas are cooked to convert the starches to sugars and to absorb flavors.

GRINDING
Cooked piñas are ground up to extract their juices. Bagasse are the fibrous remains of the agave.

FERMENTING
The juices, bagasse, pulp and water are fermented in vats to convert sugars to alcohol. This creates the wort.

DISTILLING
The wort is heated in a still to release the alcohol. The alcohol liquid is usually twice distilled to create mezcal.

Sources: Comisión Nacional para el Conocimiento y Uso de la Biodiversidad; mezcalistas.com; experienceagave.com

# Recycling Mezcal Byproducts to Reduce Waste

Mezcal production in Mexico jumped 700% between 2011 and 2021. The higher production levels generate more byproducts and now people are looking at ways to reduce the environmental impact of the waste through recycling.

## Estimating byproduct amounts from mezcal production in Mexico, 2021

An estimated 136,000 tons of wet bagasse and 80 million liters of vinasse was generated.

| Byproducts | Traditional disposal | Recycling |
|---|---|---|
| **AGAVE LEAVES** Cuttings left over from harvesting the mature piña — the agave heart. | Tossed on the ground and left to dry/rejoin the soil or they are burned. | **AGAVE LEAVE USES** - Livestock feed - Fiber for pet food |
| **BAGASSE** Pulpy, fibrous remains of the cooked piñas after they are ground up. | Dumped onto the ground or into the rivers. | **BAGASSE USES** - Fiber for construction - Pet food - Compost |
| **VINASSES** Acidic liquid left over from distilling. Contains toxic and organic matter that is resistant to decomposition. | Dumped onto the ground or into the rivers. | **VINASSES USES** - Biofuel - Tetra Pak packaging - Alcohol - Biofertilizers |

Sources: Consejo Mexicano Regulador de la Calidad del Mezcal A.C.; "Uso de bagazo de la industria mezcalera como materia prima para generar energía" by Leonardo Chávez-Guerrero; "Producción de biogás a partir del bagazo de agave pulquero utilizando la radiación solar y catalizadores sólidos" by Navarrete Magaña and Alejandra Michelle; "El mezcal, su producción y tratamiento de residuos" by Angélica Rodríguez Cortés and Carla de la Cerna Hernández; "Biorremediación De Vinazas De La Industria Tequilera Y Mezcalera Mediante Tratamiento Fisicoquímico Y Biológico" by José Luis Retes Pruneda

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**Estimating byproduct amounts from mezcal production in Mexico, 2021**
An estimated 136,000 tons of wet bagasse and 80 million liters of vinasse was generated.

1 liter of mezcal = 17kg of wet bagasse + 10 liters of vinasses

**Byproducts** **Traditional disposal** **Recycling**

**Byproducts**
AGAVE LEAVES
Cuttings left over from harvesting the mature piña — the agave heart.

**Traditional disposal**
Tossed on the ground and left to dry/rejoin the soil or they are burned.

**Recycling**
AGAVE LEAVE USES
- Livestock feed
- Fiber for pet food

**Byproducts**
BAGASSE
Pulpy, fibrous remains of the cooked piñas after they are ground up.

**Traditional disposal**
Dumped onto the ground or into the rivers.

**Recycling**
BAGASSE USES
- Fiber for construction
- Pet food
- Compost

**Byproducts**
VINASSES
Acidic liquid left over from distilling. Contains toxic and organic matter that is resistant to decomposition.

**Traditional disposal**
Dumped onto the ground or into the rivers.

**Recycling**
VINASSES USES
- Biofuel
- Tetra Pak packaging
- Alcohol
- Biofertilizers

Sources: Consejo Mexicano Regulador de la Calidad del Mezcal A.C.; “Uso de bagazo de la industria mezcalera como materia prima para generar
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# SOURCE MATERIALS and LINKS

## MAP

Maps showing the denominations of origin in Mexico
https://agavache.com/lo-que-todos-deben-saber-sobre-la-denominacion-de-origen-mezcal/

## Graphic #1

Mezcal-making process
http://bioteca.conabio.gob.mx/janium/Documentos/5324.pdf

**GRAPHIC #2**

**1 liter of mezcal = 17kg of wet bagasse + 10 liters of vinasse**

**Sources for equation:** CQ_Link, CQ_Link, CQ Link, CQ_Link_PDFpage32_PUBpage24

WASTE RECYCLING:
Residue: Fresh leaves and spikes, cut off the agave in order to obtain the heart (piña):
Use: Silage to feed goats, sheep, cattle

Residue: Bagasse, or the parts that come off the cooked and fermented heart.
Use: Fiber for construction, pet food

Residue: Vinasse, a residue of the distilling process.
Use: Biofuel, tetrapack, alcohol, biofertilizers.